

REMARKS

The applicant thanks the Examiner for the thorough examination of the application. No new matter is believed to be added to the application by this Reply.

Status of the Claims

Claims 1-20 are pending in the application. Claims 5 and 16 have been amended to improve the antecedence.

Objections to the Claims

Claims 6 and 16 are objected to as having insufficient antecedent basis. The Examiner's comments have been considered. Claims 6 and 16 have been amended to have full antecedent basis.

Rejection Under 35 U.S.C. § 102(e) Over Nagakubo And Under 35 U.S.C. § 103(a) Over Nagakubo And Mashino

Claims 1-5, 7, 9 and 10 are rejected under 35 U.S.C. § 102(e) as being anticipated by Nagakubo (U.S. Patent 6,219,117 B1). Claims 6 and 8 are rejected under 35 U.S.C. §103(a) as being obvious over Nagakubo in view of Mashino (U.S. Patent 5,886,759). Applicant traverses.

The Present Invention and its Advantages

The present invention pertains to a back light for a liquid crystal display device that utilizes a novel reflector that includes colorless ink containing a light scattering agent. Independent claims 1 and 11 of the invention recite an optical component that "includes a printing portion made of colorless ink containing a light scattering agent."

Similarly, independent claims 3 and 12 contain the limitation: "a printing portion made of colorless ink containing a light scattering agent."

That is, independent claims 1, 3, 11 and 12 of the invention recite "colorless ink containing a light scattering agent."

The technology of the invention can be better understood by considering the embodiment shown in Figure 7 of the application, which is reproduced below.

Fig.7

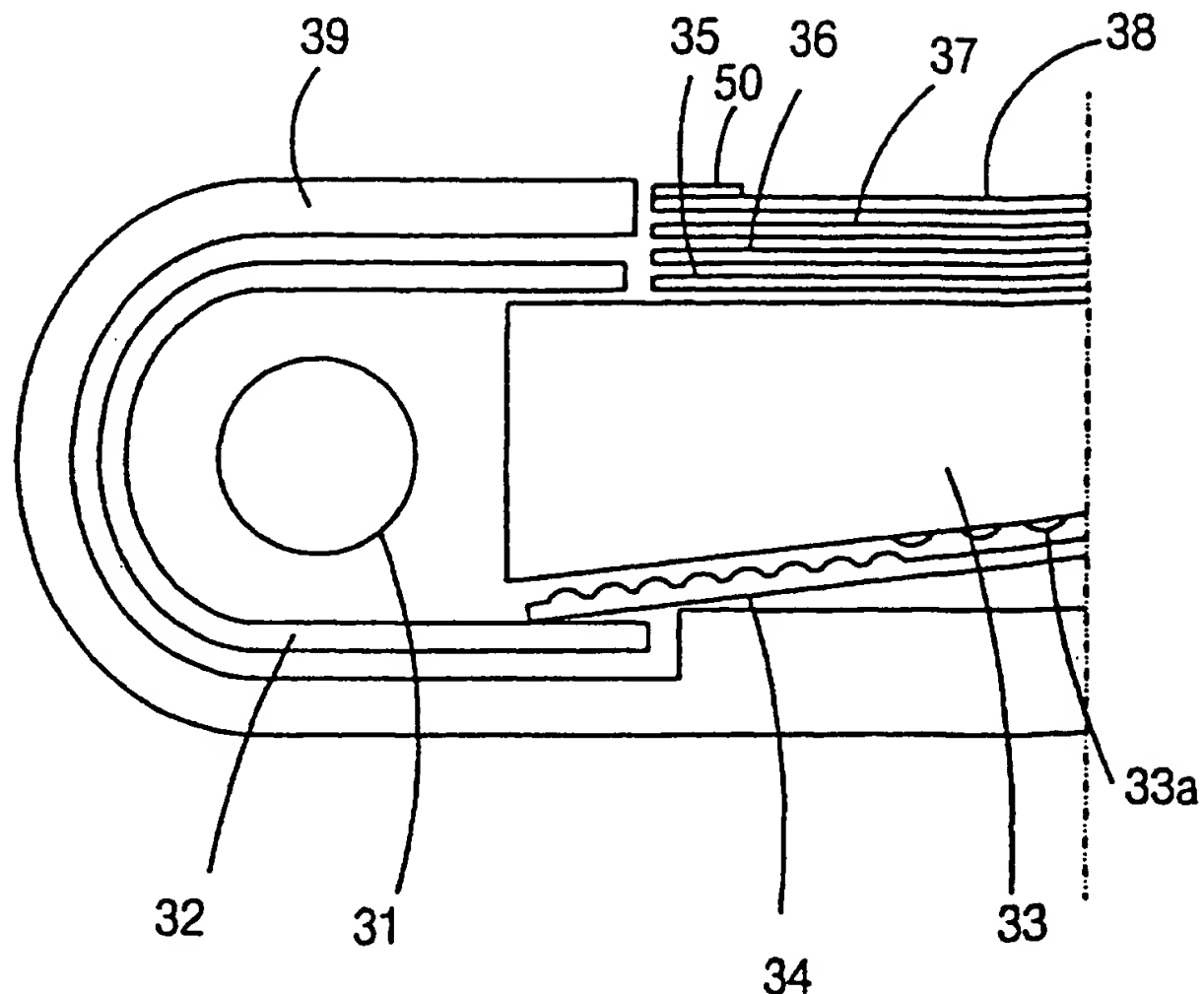


Figure 7 shows a light guide plate 33 over which several sheets are stacked, including a diffusing sheet 35, two prism sheets 36 and 37, and a protecting sheet 38. It is the protecting sheet 38 that has that the printing portion 50 that is made of colorless ink into which a light scattering agent interspersed. Alternately, Figure 6 shows the printing portion 50 being located on the diffusing sheet 35.

In Figure 7, the opposite side of the light guide plate 33 has a surface on which the patterns 33a are found. The patterns, which can be dots, can be formed by printing, v-cut, molding, etc. Also, a reflector 34 has crenellations corresponding to the area of the light guide plate that is free from patterns. The

entire construction thus interacts to produce a uniform light distribution having no bright line phenomena.

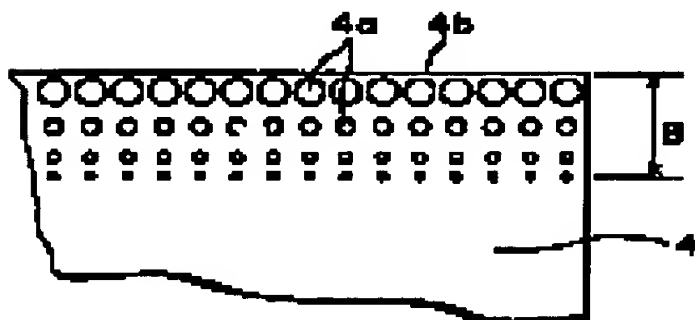
That is, in the invention, the printing portion (made of colorless ink containing light scattering material) and the dot pattern are two fundamentally different structures that can be located at different locations on opposite sides of the light guide plate 33.

Distinctions of the Invention Over Nagakubo and Mashino

Distinctions of the invention over Nagakubo and Mashino have been placed before the Examiner. Nagakubo fails to disclose or suggest "a printing portion made of colorless ink containing a light scattering agent." See claims 1, 3, 11 and 12 of the invention.

Figure 3 of Nagakubo is reproduced below.

FIG. 3



*Figure 3 of
Nagakubo*

Nagakubo at column 7, lines 22-34, has the following disclosure:

As shown in FIG. 3, since the **diffusion plate** 4 has the light quantity control portion 4a formed on the one surface thereof which is not subjected to the glaring prevention on the end 4b side located near to the backlight source 8, the light quantity control portion 4a being formed by print or the like to a dot pattern which is **composed of a white material having a light transmitting property to a certain extent**, a part of the light from the backlight source 8 passes through the light quantity control portion 4a and emerges to the lens sheets 3 on the light quantity control portion 4a and the remaining light reflects at the light quantity control portion 4a and makes **irregular reflection** in the light transmission member 5. (emphases added)

However, the transmission/reflection property described in Nagakubo is fundamentally different than the light scattering material of the invention, as has been described in previous responses. That is, the dot pattern of Nagakubo is to control the quantity of light and is comparable to the dot pattern 33a of the invention. However, this optical structure is fundamentally different from the printing portion 50 of the invention, which functions to scatter light (to prevent bright line), and not to control the quantity of light.

Further, the Examiner asserts that the "white material" of Nagakubo is equivalent to the colorless ink of the invention. However, the inability of a white material to be comparable to colorless ink is on record in the application and will not be repeated here for the sake of brevity. However, applicant notes that colorless inks, i.e., varnishes, are well known.

Also, the light scattering function of the printing portion 50 renders this element highly versatile regarding its location. Independent claims 1 and 3 recite

“at least one of an edge portion of the diffusing sheet adjacent to the lamp, an edge portion of the protecting sheet adjacent to the lamp, or the reflector includes a printing portion made of colorless ink containing a light scattering agent.” Independent claims 11 and 12 recite: “at least one of an edge portion of the protecting sheet adjacent to the lamp or the reflector includes a printing portion made of colorless ink containing a light scattering agent.”

The Examiner then turns to Mashino for teachings pertaining to dots printed on a light guide. Mashino at column 4, lines 34-36 discusses white colored dots on the underside of a light guide. Mashino at column 4, line 41 teaches gray colored dots. As a result, Mashino clearly teaches using colored dots in order to control the quantity of light. Mashino therefore fails to address the failures of Nagakubo in teaching or suggesting a printing portion made of colorless ink containing light scattering material.

Therefore Nagakubo clearly fails to anticipate the invention. Mashino fails to address the deficiencies of Nagakubo. As a result, one having ordinary skill in the art would not be motivated by Nagakubo and Mashino to produce a claimed embodiment of the invention. A *prima facie* case of obviousness has thus not been made.

These rejections are overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §103(a) Over Suga In View of Nagakubo

Claims 11-20 are rejected under 35 U.S.C. §103(a) as being obvious over the combination of Suga (U.S. Patent 6,425,673) in view of Nagakubo. Applicant traverses.

Suga pertains to a light guide pipe having elongate roughened protrusions and/or roughened concaves. Suga fails to disclose or suggest a printing portion formed from a colorless ink in which light scattering material has been interspersed.

The Examiner turns to Figure 2 of Suga, which shows a lamp, a light guide plate 2, a diffusing sheet 13, a prism sheet 12 and a reflector 14.

The Examiner then turns to Figure 6B of Suga, which is reproduced below.

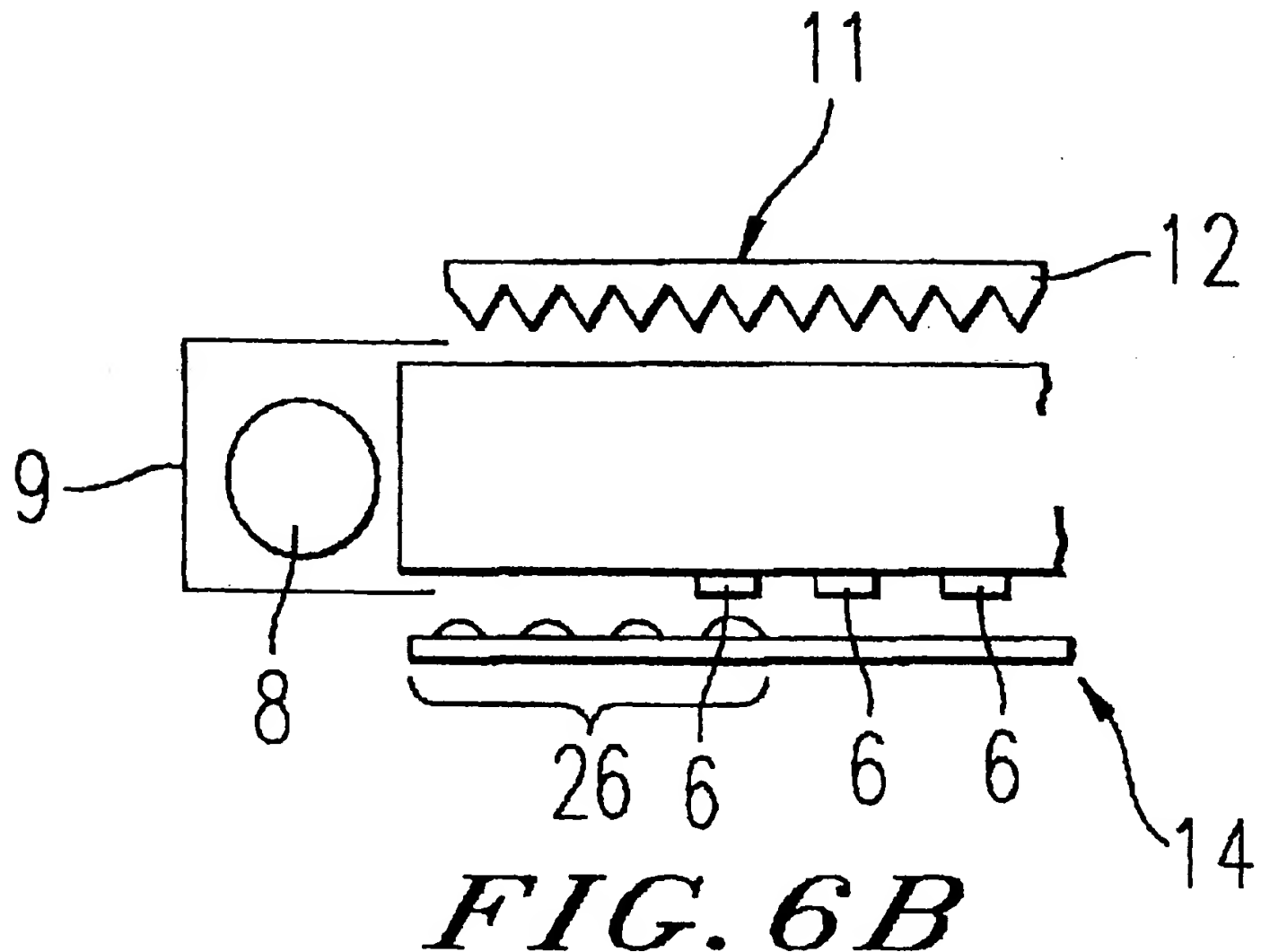


Figure 6B of Suga shows a reflector 14 having a diffusion reflective pattern of white ink in a close area 26 (Suga at column 13, lines 9-24). Element 6 is surface roughened protrusions, i.e., net dots (Suga at column 6, lines 65-66). This construction of Suga is comparable to the crenellated reflector 34 and the light guide patterns 33a of the invention.

At page 5, lines 18-20 of the Office Action, the Examiner asserts that the white ink of Suga is comparable to the colorless ink of the invention. However, this structure of Suga has a fundamentally function (light control) and location

(under the light guide) than that found in the invention. Also, as discussed above, a white ink is different and cannot be compared to a colorless ink. As a result, Suga utterly fails to disclose or suggest a printing portion formed from a colorless ink containing light scattering material, such as is claimed in the independent claims of the invention.

The Examiner then turns to Figure 1 of Nagakubo for teachings pertaining to a protecting sheet and a prism sheet. However, these teachings of Nagakubo fail to address the inability of Suga to teach or suggest a claimed embodiment of the invention where a printing portion is formed from a colorless ink containing light scattering material.

As a result, one having ordinary skill in the art would not be motivated by the combination of Suga and Nagakubo to produce the invention of independent claims 11 and 12. A *prima facie* case of obviousness has thus not been made. Claims depending on claims 11 and 12 are patentable for at least the above reasons.

This rejection is overcome and withdrawal there of is respectfully requested.

Foreign Priority

The Examiner has acknowledged foreign priority most recently in the Office Action mailed February 26, 2004.

The Drawings

The Examiner is respectfully requested to indicate whether the drawing figures are acceptable in the next official action.

Conclusion

The Examiner's objection and rejections have been rendered moot, obviated or overcome. No issues remain. The Examiner is accordingly respectfully requested to allow the application.


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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